



UPONOR, INC.
5925 148th Street West
Apple Valley, MN 55124
<https://www.uponor.com/en-us>

**AQUAPEX AND AQUAPEX RECLAIMED
 WATER PRESSURE RATED TUBING,
 HEPEX PRESSURE RATED TUBING,
 PROPEX COMPRESSION, AND WIPEX
 FITTINGS**

CSI Section:

22 11 16 Domestic Water Piping
23 21 13 Hydronic Piping

1.0 RECOGNITION

The pressure ratings at a given temperature, physical characteristics, drinking water system components and pipe sizing and pressure loss characteristics properties of the AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, hePEX Pressure Rated Tubing, Propex Fittings, Compression Fittings, and Wipex Fittings have been evaluated and comply with the intent of the provisions of the following codes and regulations:

- 2021, 2018, 2015, 2012, and 2009 Uniform Plumbing Code® (UPC)
- 2021, 2018, 2015, 2012, and 2009 Uniform Mechanical Code® (UMC)
- 2019, 2016, and 2013 California Plumbing Code® (CPC) – See Attached Supplement
- 2021, 2018, 2015, 2012, and 2009 International Building Code® (IBC)
- 2021, 2018, 2015, 2012, and 2009 International Residential Code® (IRC)
- 2021, 2018, 2015, 2012, and 2009 International Plumbing Code® (IPC)
- 2021, 2018, 2015, 2012, and 2009 International Mechanical Code® (IMC)
- National Plumbing Code 2015-CANADA (NPC CA) – See Attached Supplement
- 2021, 2018, 2015, 2012, and 2009 National Standard Plumbing Code (NSPC) – See Attached Supplement

2.0 LIMITATIONS

Use of the AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, hePEX Pressure Rated Tubing, Propex, Compression, and Wipex Fittings recognized in this report is subject to the following limitations:

2.1 When the installation is in fire-resistive assemblies, evidence of compliance with IBC shall be provided to the building official for approval.

2.2 The tubing and fittings shall be protected from exposure to direct sunlight as noted in the manufacturer’s installation instructions.

2.3 Clearances from heat-producing equipment shall be in accordance with the applicable code. In areas enforcing the Uniform Plumbing Codes prohibits the installation of PEX within 18 inches (457 mm) of a water heater.

2.4 The tubing shall be maintained at the proposed operating pressure during the placement of concrete, or prior to backfilling when used in buried applications.

2.5 Minimum bending radius shall be six times the outside tube diameter of the PEX tube. The outside diameter is the nominal diameter plus 1/8 inch (3.2 mm) or copper tube size (CTS).

2.6 The hydronic system details for design and installation shall comply with the applicable code and shall be approved by the building official.

2.7 Installation of tubing shall be pressure-tested for leaks as required by UPC Section 609, or IPC Section 312, in the presence of the building official.

2.8 Backflow protection complying with the applicable code shall be provided for the potable water connections serving the Hydronic systems.

2.9 The tubing shall not be utilized as a source of electrical ground.

2.10 Uponor products recognized in this report shall be installed in accordance with the applicable code, the manufacturer’s published installation instructions, and this report. Where there is a conflict, the most restrictive requirements shall govern.

2.11 The Uponor products recognized in this report are produced under a quality control program in Apple Valley, MN; Brescia, Italy; Circle Pines, MN; Frankfort, IL; Hartsville, SC; Hutchinson, MN; Lakeville, MN; Lakeville-Hamburg Facility, MN; San Maurizio d’Opaglio, Italy; Webster City, IA; and Whitewater, WI.

3.0 PRODUCT USE

3.1 General: Uponor’s AquaPEX cross-linked polyethylene (PEX) tubing and fittings are used in potable hot and cold water distribution, water service, and radiant heating and cooling systems in buildings of any type of construction

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.





allowed under the applicable code. Uponor hePEX cross-linked polyethylene (PEX) tubing and fittings are used in radiant heating and cooling systems. The piping and fittings comply with the following:

UPC: Sections 313, 604, 605, 609 and 610

UMC: Sections 316 and 1201

IBC: Section 603.1.2

IRC: Sections M1301, M2101, M2103, M2104, P2609, and P2905

IPC: Sections 308, 605, Appendix E

IMC: Sections 305, 1202, and 1203

3.2 Design and Installation:

3.2.1 Installers shall be factory trained and approved by Uponor North America.

3.2.2 [Table 1](#) of this report shall be used in lieu of UPC or CPC Table 610.4 for sizing PEX-a/F1960 domestic water systems.

3.2.3 For PEX radiant systems, hydronic piping systems and domestic water systems that are outside the scope of the parameters in [Table 1](#) of this report, the design shall comply with applicable provisions in the UPC, UMC, CPC, IPC, IMC, CSA B214 NPC CA, or NSPC. The sizing design shall incorporate values taken from Uponor Pressure/Friction Loss charts and tables in conjunction with Cv data, which shall be available upon request from Uponor North America.

3.3 Water Service and Water Distribution: Tubing installed horizontally shall be laid or supported in a manner that assures the temperature expansion and contraction joints are securely accommodated for.

3.4 Radiant Systems: The radiant heating/cooling (hydronic) system installation and design for each type of construction shall be in accordance with Chapter 12 of UMC; Chapter 12 of the IMC, Chapter 21 of the IRC, the manufacturer's published installation instructions, and this report. In the event of a discrepancy between this report and the manufacturer's installation instructions, the more restrictive governs.

Tubing installed horizontally shall be laid or supported in a manner that the temperature expansion and contraction is accommodated for.

4.0 PRODUCT DESCRIPTION

4.1 General: Uponor Crosslinked Polyethylene Water Distribution System (PEX) has been documented for conformance with ASTM F877-2020 and NSF/ANSI 14-2014 separately by IAPMO R&T as recognized in File #3558.

4.1.1 AquaPEX, AquaPEX Reclaimed Water, and hePEX Tubing: Uponor's AquaPEX, AquaPEX Reclaimed Water and hePEX Tubing are manufactured in a Standard Dimensional Ratio of 9 (SDR 9). The tubing is produced from a cross-linked polyethylene compound complying with ASTM F876, and has a 100 psi (690 kPa) pressure rating at 180°F.

4.1.2 AquaPEX: AquaPEX is available in nominal sizes of 1/4 inch through 3-inch (6.35 through 76.2 mm) diameters. Uncoated (natural) AquaPEX has a material designation of PEX 5106. Coated (blue & red) AquaPEX has a material designation of PEX 5206. AquaPEX is recognized as conforming to ASTM F 876, as well as conforming to NSF 61 and NSF 14.

4.1.3 hePEX: hePEX is used for non-potable and portable applications, such as radiant heating and cooling, and is available in nominal diameters from 5/16 inch through 4 inches (7.94 mm through 102 mm). Uponor hePEX contains an oxygen barrier layer. hePEX is recognized as conforming to ASTM F876 as well as conforming to NSF 61 and NSF 14.

4.2 Fittings

4.2.1 ProPEX Fittings: Uponor's ProPEX fittings are made of either brass or engineered polymer (EP) and utilize a PEX reinforcing ring in accordance with ASTM F1960. The fitting is installed in the end of the PEX tubing by expanding the tube and PEX reinforcing ring with an expansion tool supplied by Uponor North America or Milwaukee Electric Tool Corporation. The insert end of the fitting is then inserted into the expanded end of the tubing, and within a short period of time the tubing and ring contract around the fitting. ProPEX fittings are available in nominal sizes from 3/8 inch through 3-inch (9.53 mm through 76.2 mm) diameters. ProPEX fittings comply with ASTM F1960.

4.2.2 Compression Fittings: Uponor's compression type fittings consist of a nut, compression ring, and insert. Compression type fittings are available in nominal sizes from 3/8 inch through 1-inch (9.53 mm through 25.4 mm) diameters. The compression fittings comply with ASTM F877 when used with Uponor AquaPEX, AquaPEX Reclaimed Water, or hePEX tubing.

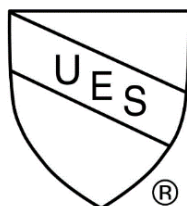
4.2.3 Wipex Fittings - Uponor Wipex fitting system utilizes a double O-ring, brass insert with a brass compression sleeve on the outside of the tubing. Compression fittings comply with NSF 14 and ASTM F877 when used with Uponor AquaPEX or hePEX tubing.

5.0 IDENTIFICATION

Products recognized in this report are identified by the Report Holder's name and or trademark, product identifier, evaluation report number (UES ER253) and the identification required by IAPMO R&T File 3558. The IAPMO Uniform



Evaluation Service Mark of Conformity may be used as shown below:



IAPMO UES ER-253

6.0 SUBSTANTIATING DATA

6.1 Test reports are from laboratories in compliance with ISO/IEC 17025.

6.2 Manufacturer's descriptive literature and installation instructions.

6.3 IAPMO R&T Listing File 3558 for UPONOR Crosslinked Polyethylene Water Distribution System (PEX).

6.4 Reports of testing to the following Standards: :

- ASTM F876-10 Standard Specification for Crosslinked Polyethylene (PEX).
- ASTM F877, Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot – and Cold-Water Distribution Systems.
- ASTM F1960, Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing.
- NSF 61, Drinking Water System Components – Health Effects.
- NSF 14, Plastic Piping System Components and Related Materials.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on Uponors AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, hePEX Pressure Rated Tubing, Propex, Compression and Wipex Fittings to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured at locations noted in Section 2.11 of this report under a quality control program with periodic inspections under the supervision of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



TABLE 1

FIXTURE UNIT TABLE FOR DETERMINING MINIMUM WATER TUBING SIZES

Meter and Street Service, Inches	Building Supply and Branches, Inches	MAXIMUM ALLOWABLE LENGTH IN FEET (meters)														
		40 (12)	60 (18)	80 (24)	100 (30)	150 (46)	200 (61)	250 (76)	300 (91)	400 (122)	500 (152)	600 (183)	700 (213)	800 (244)	900 (274)	1000 (305)
Pressure Range – 30 to 45 psi (207 to 310 kPa)**																
3/4	1/2***	6	5	4	3	2	1	1	1	0	0	0	0	0	0	0
3/4	3/4	16	16	14	12	9	6	5	5	4	4	3	2	2	2	1
3/4	1	29	25	23	21	17	15	13	12	10	8	6	6	6	6	6
1	1	36	31	27	25	20	17	15	13	12	10	8	6	6	6	6
3/4	1-1/4	36	33	31	28	24	23	21	19	17	16	13	12	12	11	11
1	1-1/4	54	47	42	38	32	28	25	23	19	17	14	12	12	11	11
1-1/2	1-1/4	78	68	57	48	38	32	28	25	21	18	15	12	12	11	11
1	1-1/2	85	84	79	65	56	48	43	38	32	28	26	22	21	20	20
1-1/2	1-1/2	150	124	105	91	70	57	49	45	36	31	26	23	21	20	20
2	1-1/2	151	129	129	110	80	64	53	46	38	32	27	23	21	20	20
1	2	85	85	85	85	85	85	82	80	66	61	57	52	49	46	43
1-1/2	2	220	205	190	176	155	138	127	120	104	85	70	61	57	54	51
2	2	370	327	292	265	217	185	164	147	124	96	70	61	57	54	51
2	2-1/2	445	418	390	370	330	300	280	265	240	220	198	175	158	143	133
Pressure Range – 46 to 60 psi (317 to 414 kPa)**																
3/4	1/2***	7	7	6	5	4	3	2	2	1	1	1	0	0	0	0
3/4	3/4	20	20	19	17	14	11	9	8	6	5	4	4	3	3	3
3/4	1	39	39	36	33	28	23	21	19	17	14	12	10	9	8	8
1	1	39	39	39	36	30	25	23	20	18	15	12	10	9	8	8
3/4	1-1/4	39	39	39	39	39	39	34	32	27	25	22	19	19	17	16
1	1-1/4	78	78	76	67	52	44	39	36	30	27	24	20	19	17	16
1-1/2	1-1/4	78	78	78	78	66	52	44	39	33	29	24	20	19	17	16
1	1-1/2	85	85	85	85	85	85	80	67	55	49	41	37	34	32	30
1-1/2	1-1/2	151	151	151	151	128	105	90	78	62	52	42	38	35	32	30
2	1-1/2	151	151	151	151	150	117	98	84	67	55	42	38	35	32	30
1	2	85	85	85	85	85	85	85	85	85	85	85	85	85	83	80
1-1/2	2	370	370	340	318	272	240	220	198	170	150	135	123	110	102	94
2	2	370	370	370	370	368	318	280	250	205	165	142	123	110	102	94
2	2-1/2	654	640	610	580	535	500	470	440	400	365	335	315	285	267	250
Pressure Range – Over 60 psi (414 kPa)**																
3/4	1/2***	7	7	7	6	5	4	3	3	2	1	1	1	1	1	0
3/4	3/4	20	20	20	20	17	13	11	10	8	7	6	6	5	4	4
3/4	1	39	39	39	39	35	30	27	24	21	17	14	13	12	12	11
1	1	39	39	39	39	38	32	29	26	22	18	14	13	12	12	11
3/4	1-1/4	39	39	39	39	39	39	39	39	34	28	26	25	23	22	21
1	1-1/4	78	78	78	78	74	62	53	47	39	31	26	25	23	22	21
1-1/2	1-1/4	78	78	78	78	78	74	65	54	43	34	26	25	23	22	21
1	1-1/2	85	85	85	85	85	85	85	85	81	64	51	48	46	43	40
1-1/2	1-1/2	151	151	151	151	151	151	130	113	88	73	51	51	46	43	40
2	1-1/2	151	151	151	151	151	151	142	122	98	82	64	51	46	43	40
1	2	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
1-1/2	2	370	370	370	370	360	335	305	282	244	212	187	172	153	141	129
2	2	370	370	370	370	370	370	370	340	288	245	204	172	153	141	129
2	2-1/2	654	654	654	654	654	650	610	570	510	460	430	404	380	356	329

** Available static pressure after head loss.

*** Building supply, not less than three-quarter (3/4) inch (20 mm) nominal size.



CALIFORNIA SUPPLEMENT

UPONOR, INC.

5925 148th Street West

Apple Valley, MN 55124

<https://www.uponor.com/en-us>

AQUAPEX AND AQUAPEX RECLAIMED WATER PRESSURE RATED TUBING HEPEX PRESSURE RATED TUBING PROPEX, COMPRESSION AND WIPEX FITTINGS

CSI Section:

22 11 16 Domestic Water Piping

23 21 13 Hydronic Piping

1.0 RECOGNITION

The pressure ratings at a given temperature, physical characteristics, drinking water system components and pipe sizing and pressure loss characteristics properties of the AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, hePEX Pressure Rated Tubing, Propex Fittings, Compression Fittings, and Wipex Fittings have been evaluated and comply with the intent of the provisions of the following codes and regulations:

2019, 2016, and 2013 California Plumbing Code (CPC)

2.0 LIMITATIONS

Use of Uponor's AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing Pressure Rated Tubing Propex Fittings, Compression Fittings, and Wipex Fittings recognized in this report is subject to the following limitations:

2.1 The requirements of ER-253 are applicable under this supplement.

2.2 Installation of tubing shall be pressure-tested for leaks as required by CPC Section 609 in the presence of the building official.

2.3 This supplement expires concurrently with ER-253.

3.0 PRODUCT USE

Uponor's AquaPEX cross-linked polyethylene (PEX) tubing and fittings are used in potable hot and cold-water distribution, water service and radiant heating and cooling systems in buildings of any type construction allowed under the applicable code. Uponor hePEX cross-linked polyethylene (PEX) tubing and fittings are used in radiant heating and cooling systems. The piping and fittings comply with Sections 313, 604, 605, 609, and 610 of the CPC.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



NATIONAL PLUMBING CODE 2015- CANADA (NPC CA) SUPPLEMENT

UPONOR, INC.

5925 148th Street West

Apple Valley, MN 55124

<https://www.uponor.com/en-us>

AQUAPEX AND AQUAPEX RECLAIMED WATER PRESSURE RATED TUBING HEPEX PRESSURE RATED TUBING PROPEX, COMPRESSION AND WIPEX FITTINGS

CSI Section:

22 11 16 Domestic Water Piping

23 21 13 Hydronic Piping

1.0 RECOGNITION

The pressure ratings at a given temperature, physical characteristics, drinking water system components and pipe sizing and pressure loss characteristics properties of the AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, hePEX Pressure Rated Tubing, Propex Fittings, Compression Fittings, and Wipex Fittings have been evaluated and comply with the intent of the provisions of the following codes and regulations:

National Plumbing Code 2015-CANADA (NPC CA)

2.0 LIMITATIONS

Use of Uponor's AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, hePEX Pressure Rated Tubing, Propex Fittings, Compression Fittings, and Wipex Fittings recognized in this report is subject to the following limitations:

2.1 The requirements of ER-253 are applicable under this supplement.

2.2 Installation of tubing shall be pressure-tested for leaks as required by NPC CA Section 2.3.7 in the presence of the building official.

2.3 This supplement expires concurrently with ER-253.

3.0 PRODUCT USE

Uponor's AquaPEX cross-linked polyethylene (PEX) tubing and fittings are used in potable hot and cold-water distribution, water service and radiant heating and cooling systems in buildings of any type construction allowed under the applicable code. Uponor hePEX cross-linked polyethylene (PEX) tubing and fittings are used in radiant heating and cooling systems. The piping and fittings comply with Sections 2.2.5.7 and 2.3.4.5 of the NPC CA.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



NATIONAL STANDARD PLUMBING CODE (NSPC) SUPPLEMENT

UPONOR, INC.

5925 148th Street West

Apple Valley, MN 55124

<https://www.uponor.com/en-us>

AQUAPEX AND AQUAPEX RECLAIMED WATER PRESSURE RATED TUBING HEPEX PRESSURE RATED TUBING PROPEX, COMPRESSION AND WIPEX FITTINGS

CSI Section:

22 11 16 Domestic Water Piping

23 21 13 Hydronic Piping

1.0 RECOGNITION

The pressure ratings at a given temperature, physical characteristics, drinking water system components and pipe sizing and pressure loss characteristics properties of the AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, hePEX Pressure Rated Tubing, Propex Fittings, Compression Fittings, and Wipex Fittings have been evaluated and comply with the intent of the provisions of the following codes and regulations:

2021, 2018, 2015, 2012, 2009 National Standard Plumbing Code (NSPC)

2.0 LIMITATIONS

Use of Uponor's AquaPEX and AquaPEX Reclaimed Water Pressure Rated Tubing, Pressure Rated Tubing, Propex Fittings, Compression Fittings, and Wipex Fittings recognized in this report is subject to the following limitations:

2.1 The requirements of ER-253 are applicable under this supplement.

2.2 Installation of tubing shall be pressure-tested for leaks as required by NSPC Section 15.6 in the presence of the building official.

2.3 This supplement expires concurrently with ER-253.

3.0 PRODUCT USE

Uponor's AquaPEX cross-linked polyethylene (PEX) tubing and fittings are used in potable hot and cold-water distribution, water service and radiant heating and cooling systems in buildings of any type construction allowed under the applicable code. Uponor hePEX cross-linked polyethylene (PEX) tubing and fittings are used in radiant heating and cooling systems. The piping and fittings comply with Section 3.4 of the NSPC.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org